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ABSTRACT

To increase access to the media collection at the Madison Area Technical College (Wisconsin) a computer-produced key work index was created using an International Business Machine (IBM) 360 model 40 computer and a duplicating facility with offset capability. A standard 80 column IBM card was used reserving columns 1-9 for the media item number, 11-78 for the title, and column 80 for a location mark indicating the campus. Use of the automated media guide has increased media center circulation nearly 100%. Printout size was a problem, and a switch to printing on microfiche or accessing the media tape via cathode ray terminal was planned. (Author/DS)

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Computer Produced Media Guides

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Nicolet college and Technical Institute
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Madison Area Technical College
Madison, Wisconsin

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Rationale

Impetus for the Madison Area Technical College computer produced media guide came from three types of faculty request. Previously the media collection has been uncataloged and faculty members wanted some type of bibliographic access to the collection. Faculty members also wanted more detailed access to the collection than they were likely to receive from a traditional card catalog. For example, a set of 100 transparencies about carpentry is very likely to have the word - Carpentry - in the general title as well as subject headings pertaining to carpentry. Unless the set is indexed item by item, an instructor who wants to do a presentation on roof styles could miss the 20-25 transparencies in the general set on carpentry which might show different types of roof framing. And finally, faculty members wanted a media guide that could be mass printed to provide each faculty members with an office copy.

In addition to the faculty request that the media be cataloged in great detail and the need to furnish each faculty member with a copy of the media guide, the library imposed two other requirements on the project. Staff time available was two weeks of Christmas vacation and total cost per copy was not to exceed $2.00.

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Resources

Human resources available for the project included four work-study students who had learned to keypunch as part of their general library duties, one librarian who knew the user control language and format, and one cataloger who could answer student questions on punctuation, title enrichment, deletions, and abbreviations.

Hardware resources were the Madison Area Technical College IBM 360 Model 40 computer and a duplicating facility with offset capability.

Available software was a library owned keyword indexing program which was extremely flexible and had been used by the library for pamphlets, periodical article titles, serials, and equipment. This software was purchased from:

Golden Gate Systems
320 Vista Linda Drive
Mill Valley, California 94991
415-398-2623

Keyword Index Production

Since all media items at Madison Area Technical College were numbered the first requirement in producing an automated media guide was to establish a format which could handle the numbering system, titles, and included a location symbol for the campus where the media was located. Using a standard 80 column IBM card, columns 1-9 were reserved for the media item number, columns 11-78 were reserved for title, and column 80 was a location mark indicating campus.

Media No.	Title	Location
T750501	Special Wood Turning Chisels	T
Col. 1-9	Col. 11-78	Col. 80

In the above case, the media number requires only 7 columns instead of the 9 columns required for a number such as SFS750706 where the first three letters designate medium and the first two numbers indicate the year of purchase. Using two digits to indicate year of purchase is helpful in reviewing the collection to locate items which may be either obsolete or in poor condition. One IBM card in

the above format was keypunched for each of the 10,000 items in the collection.

The user control language specifies which columns of the individual IBM card are scanned for keywords. In this case, Columns 1 through Columns 78 are scanned. For each word encountered, an entry is stored in a massive alphabetical sort. This entry consists of the entire input record preceded by the word which serves as the sort control field.

Using the title, T750501 Special Wood Turning Chisels T, there would be stored entries under:

T750501 - SPECIAL WOOD TURNING CHISELS T
CHISELS - SPECIAL WOOD TURNING CHISELS T
SPECIAL - SPECIAL WOOD TURNING CHISELS T
TURNING - SPECIAL WOOD TURNING CHISELS T
WOOD - SPECIAL WOOD TURNING CHISELS T

Similar entries appear in the massive alphabetic sort for each of the other media items in the collection. The method for word recognition used by the computer is reading from blank to blank. This is why Column 10 between the media number and the title must be blank. The word WOOD is recognized as a word because it is preceded by and followed by a blank or space. The location symbol T is not recognized as a word because the user has specified that scanning stops two columns before the location symbol.

One available option with the software package was a FIRST option. This command produces a separate index under the first word encountered in the scan. According to the format, the media number was the first word or item encountered. Using the FIRST option effectively produces the equivalent of a shelflist.

Before any output is printed, each extracted word in the massive alphabetical sort is compared against a suppress list of words such as A, And, and The which are not desired as index words. The Madison Area Technical College Library Suppress Word List now totals 5,500 words. Using the title - T750501 SPECIAL

WOOD TURNING CHISELS T, there would be no matches for T750501, CHISELS, TURNING, and WOOD. Consequently, these entries would appear on the printout. Since there would be a match between SPECIAL as an extracted word and SPECIAL in the suppress file, there would be no printout under SPECIAL.

As an indication of typical computer time on a Madison Area Technical College guide, 10335 item cards were input on an initial run. Each of the cards contained an average number of 6.5 words per title and the scan produced 67,177 different extracted words in the massive alphabetic sort. Central processing unit time for the operation was less than 10 minutes and printing time was 34 minutes. The chain of events which occur during the 10 minutes of central processing unit time is rather spectacular. All ten thousand items are first put in alpha-numeric order under the FIRST option followed by the arrangement of each word of each title in the 67,177 word alphabetic sort. Finally each word in the alphabetic title sort is compared against a 5500 word suppress list for matches.

Project Cost

Computer Time	$ 50.00
Duplicating Supplies (paper, ink, simple cover)	390.00
Personnel (librarian, cataloger, student keypunchers, duplicating staff)	650.00
	$1,090.00

600 copies produced at $1.82 per copy.

Initial computer cost was 100 percent higher than necessary because the first copy produced was not sufficiently dark to be adequate offset copy. Installing a new ribbon on the printer at the outset would have reduced the cost per copy to $1.77.

Automation costs for first editions are generally higher than for additional productions. When Madison Area Technical College's second media catalog is printed, costs which will be eliminated for the second run will include librarian's

time spent establishing user control language and format, the cost of running the program twice to produce sufficiently dark copy for offset, and the initial cost for input of the first 10,000 items.

Costs that will remain:

Computer time (more data but more efficient use of hardware)	$ 25.00
Duplicating Supplies (500 copies)	400.00
Personnel time (cost for student keypunchers' input of 2,000 items and duplicating staff)	150.00
	$575.00

500 copies at $1.15 per copy

Additional Modifications

In its present state the Madison Area Technical College Media Guide is a keyword index based on titles. To serve more of the functions of a card catalog, it should be possible to search the media guide by production source and/or author and by additional subjects if necessary.

As faculty members used the keyword media guide last year, the keyword indexing by title invariable produced the reaction, "I had no idea we had so much material on _____ ." Media circulation increased 200% after the media guide was published. This year many faculty members have returned to borrow media they used last year, but if there were 3 sets of slides on a particular topic such as air brakes, an instructor needed some way to distinguish between the sets. Since the instructor will typically distinguish by production sources, this year's requests tend to be "I'd like to use that set of air brake slides from John Deere."

Whenever a manual system is automated, programmers and users either develop a plan to initially input all of the data to be used or else develop a format which is sufficiently flexible to allow addition of more data without requiring modification of the initial input data. Once this is done, the very real advantage of

an automated system is obvious when the results are compared to a manual system. To radically change a typed document, the document has to be retyped to either add more data if the material is in alphabetical order or to change the format. When an automated system is used the original data does not need to be keypunched again and only additions need to be keypunched. To entirely change the format, the programmer needs to change only the program and none of the data.

Consider a filmstrip such as FS750501 Learning Arc Welding Skills. Currently the IBM card for this title is:

Columns 1-9	Columns 11-78	Column 80
FS750501	LEARNING ARC WELDING SKILLS	T

There is also another arc welding filmstrip produced by another organization entitled ARC WELDING SKILLS. If an additional source card is inserted behind each of the IBM cards for title, the user can distinguish between the two similarly titled items.

Col. 8

* LINCOLN - ELECTRIC		
FS750501	LEARNING ARC WELDING SKILLS	T

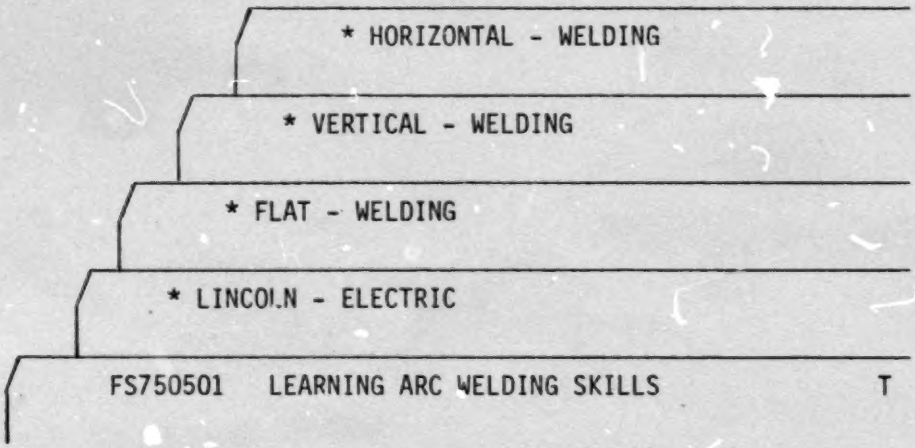
* AMERICAN - WELDING - SOCIETY		
FS000015	ARC WELDING SKILLS	T

Production source cards or the approximate equivalent of an author card in a card catalog are added to the main record by simply keypunching an (*) in column 8 of another IBM card followed in the next column by whatever the source happens to be. Internally this asterisk signals that another index of all words following

the asterisks is to be prepared. Using the two above records as examples there would be another separate keyword index produced other than the keyword by title. Two of the entries would be:

AMERICAN - WELDING - SOCIETY -	FS000015	ARC WELDING SKILLS	T
LINCOLN - ELECTRIC -	FS750501	LEARNING ARC WELDING SKILLS	T

Often a title can be more completely described by the use of subject headings. The same method for establishing production source cards is used for subject headings. Any number of asterisk cards can be used for an individual item.



FS000015 will be listed in the (*) index under AMERICAN WELDING SOCIETY and BEAD FAULTS. The title keyword indexes plus the separate index using the additional cards beginning with * and the index produced by using the FIRST option will produce the equivalent of an author, title, subject catalog plus a shelflist.

Using the examples already presented plus data for 3 additional media items as the entire data base, the following indexes would have been produced.

SHELFLIST EQUIVALENT using FIRST OPTION

FL000024	- FL000024	CAPACITORS AND DIELECTRICS	T
FL000503	- FL000503	COMPUTERIZED HIGHWAY DESIGN	T
FS000015	- FS000015	ARC WELDING SKILLS	T
FS750501	- FS750501	LEARNING ARC WELDING SKILLS	T
SFT000254	- SFT000254	NEW SOURCES OF ENERGY	T
T750501	- T750501	SPECIAL WOOD TURNING CHISELS	T

SOURCE and SUBJECT INDEX

* AMERICAN-WELDING-S	- FS000015	ARC WELDING SKILLS	T
* BEAD-FAULTS	- FS000015	ARC WELDING SKILLS	T
* CONDENSERS	- FL000024	CAPACITORS AND DIELECTRICS	T
* EALING	- FL000024	CAPACITORS AND DIELECTRICS	T
	T750501	SPECIAL WOOD TURNING CHISELS	T
* FEESER, LJ	- FL000503	COMPUTERIZED HIGHWAY DESIGN	T
* FLAT-WELDING	- FS750501	LEARNING ARC WELDING SKILLS	T
* GEOTHERMAL-ENERGY	- SFT000254	NEW SOURCES OF ENERGY	T
* HORIZONTAL-WELDING	- FS750501	LEARNING ARC WELDING SKILLS	T
* LINCOLN-ELECTRIC	- FS750501	LEARNING ARC WELDING SKILLS	T
* METHANE	- SFT000254	NEW SOURCES OF ENERGY	T
* NUCLEAR-ENERGY	- SFT000254	NEW SOURCES OF ENERGY	T
* ROADS-DESIGN	- FL000503	COMPUTERIZED HIGHWAY DESIGN	T
* RUHLE, JL	- SFT000254	NEW SOURCES OF ENERGY	T
* SOLAR-ENERGY	- SFT000254	NEW SOURCES OF ENERGY	T
* THORNE-FILMS	- FL000503	COMPUTERIZED HIGHWAY DESIGN	T
* VERTICAL-WELDING	- FS750501	LEARNING ARC WELDING SKILLS	T
* WIND-ENERGY	- SFT000254	NEW SOURCES OF ENERGY	T

KEYWORD TITLE INDEX

ARC	- FS000015	ARC WELDING SKILLS	T
	FS750501	LEARNING ARC WELDING SKILLS	T
CAPACITORS	- FL000024	CAPACITORS AND DIELECTRICS	T
CHISELS	- T750501	SPECIAL WOOD TURNING CHISELS	T
COMPUTERIZED	- FL000503	COMPUTERIZED HIGHWAY DESIGN	T
DIELECTRICS	- FL000024	CAPACITORS AND DIELECTRICS	T
ENERGY	- SFT000254	NEW SOURCES OF ENERGY	T
HIGHWAY	- FL000503	COMPUTERIZED HIGHWAY DESIGN	T
TURNING	- T750501	SPECIAL WOOD TURNING CHISELS	T
WELDING	- FS000015	ARC WELDING SKILLS	T
	FS750501	LEARNING ARC WELDING SKILLS	T
WOOD	- T750501	SPECIAL WOOD TURNING CHISELS	T

Future Changes

Two thirds of the available computer work space is now used by a data base which is expecting considerable growth and the full title keyword printout now is 300 pages long. The problem of computer work space should be solved when Madison Area Technical College changes computer hardware. Printout size is a more complex problem if each faculty member is to receive a copy of the media guide in its fullest form including title keyword index, producer keyword index, and subject index. The result could easily be 600 pages long. Before the library prints 500 copies of a 600 page document, the alternative of printing on microfiche will be explored. There are preliminary indications that a master microfiche can be produced for $8.00. Copies of the master microfiche are $.15 per 200 page sheet. Cost per faculty member for a possible 600 page edition would be $.45 plus a prorated $.02 per faculty member for production of the master microfiche.

To produce output on microfiche from magnetic tape without an intermediate paper step would require additional programming costs of approximately $300. If this were charged off on the initial run, the per faculty cost would be $.60.

The sum of these costs would be $1.07 per faculty copy.

In contrast the cost of supplies and labor to produce 500 copies each 600 pages long would be $1,800 or $3.60 per copy.

A third alternative more likely to be chosen is accessing the media tape via cathode ray terminal. Multiple terminals are planned as part of Madison Area Technical College's hardware change and faculty members will simply punch in several index words or a production source or subject from their offices and view the display.

Conclusion

To date the automated media guide has been successful. Faculty media use is virtually one hundred percent. The media center was originally built as a library and when the change to media center occurred, the accumulation of software and hardware resulted in a general state of chaos. Since the media guide has been in existence there is much less chaos because 80 percent of the hardware and 50 percent of the software are in constant use in classrooms.